

REMARKS

Reexamination and reconsideration of this application is respectfully requested in light of the foregoing amendments to the claims and the following remarks.

Claims 1-6 and 8 are pending in this application. Claims 9-12 have been canceled without prejudice or disclaimer. Claim 7 was canceled by a previous amendment. No new claims have been added. Claim 1 has been amended. No new matter has been added to the application by the amendment. Support for the amendment to claim 1 can be found in the specification at page 5, lines 7-11 and page 8, lines 16-21.

Restriction Requirement

The Requirement for Restriction between Group I (claims 1-6, 8 and 9) and Group II (claims 10-12) is noted, however, the election requirement is not understood. It would appear that the restriction has been made pursuant to 37 C.F.R. § 1.145 and that Applicant is held to the election of the invention by original presentation, i.e., claims 1-6 and 8. However, in order to comply with the Examiner's requirement for election, Applicant hereby elects the claims of Group I. Claims 10-12 have been canceled, subject to Applicant's right to file a divisional application thereon.

Rejections Under 35 U.S.C. § 112

Claim 9 was rejected under the first paragraph of 35 U.S.C. § 112(a) as failing to comply with the written description requirement. The claim has been canceled thereby rendering the rejection moot. It is respectfully requested that this rejection be withdrawn.

Claims 1-6 and 8-12 stand rejected under the second 35 U.S.C. § 112 as being indefinite. Claims 9-12 have been canceled, thereby rendering the rejection as to these claims moot.

Specifically, the Examiner found the following language in claim 1 to be indefinite: “the bond of SiO that has adhered to the interfaces of the air holes is stabilized.” The objected to language has been deleted from the claim 1. The Examiner was of the further opinion that the second step of the claim recites suppressing the formation of SiO gas, but that it was “unclear what bond of SiO is adhered, if SiO is suppressed in the second step.” To clarify this issue, claim 1 has been amended to recite that in the second step, the oxygen is present in the through holes to suppress the formation of the SiO gas, but some of the SiO gas is formed in the through holes and SiO unstably adheres to the interfaces of the air holes. In view of these amendments, it is believed that the rejection of claims 1-6 and 8 under the second paragraph of 35 U.S.C. § 112 has been overcome. It is respectfully requested that the rejection be reconsidered and withdrawn.

Rejection Under 35 U.S.C. § 103 of Claims 1-6 and 9

Claims 1-6 and 9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Arimondi et al. (U.S. Published Application No. 2005/0072192) in view of Nagayama et al. (U.S. Published Application No. 2002/0059816 hereinafter “Nagayama I”), Nagayama et al. (U.S. Patent No. 6,400,878 hereinafter “Nagayama II), and Suzuki et al. (U.S. Published Application No. 2003/0126891).

Arimondi et al. disclose a method for preparing an optical fiber preform having through holes to be formed into air holes and drawing the optical fiber preform into a fiber with the air holes. The Examiner concedes, however, that Arimondi et al. do not disclose “the presence of oxygen gas in the through holes.”

For this deficiency, the Examiner relies on Suzuki et al. as teaching that the presence of oxygen suppresses the formation of SiO. Suzuki discloses the formation of an optical fiber

preform from a mother ingot. The reference does not disclose or suggest that through holes are formed in the optical fiber preform, let alone drawing an optical fiber in a drawing furnace to form an optical fiber having air holes containing SiO gas.

While Suzuki et al. disclose that oxygen will suppress the formation of SiO gas, there is no disclosure or teaching in Suzuki et al. that would lead a person of ordinary skill in the art to know that SiO gas is produced in the air holes of Arimondi's fiber and that the SiO gas adheres to the interfaces of the air holes as required by claim 1. Therefore, it is unclear how it would have been obvious to a person skilled in the art to "utilize oxygen present in the air holes of the optical fiber preform of Armondi et al. ... to prevent the sublimation of SiO" when there is no teaching or suggestion that the air holes of Armondi et al. contain SiO gas. The only source for this suggestion could only have come from Applicant's disclosure. In addition to the above, neither Arimondi et al. nor Suzuki et al. are directed to the problem solved by Applicant, namely, reducing transmission loss by reducing SiO gas in air holes of the optical fiber.

The Examiner further concedes that Arimondi et al. do not disclose the third step of the claimed process, i.e., "heating the optical fiber in an additional furnace. The Examiner relies on Nagayama II to cure this deficiency. However, Nagayama II does not make up for the deficiencies of Arimondi et al or Suzuki et al.. Nagayama II is directed to an optical fiber preform which is drawn by a drawing furnace to yield an optical fiber. The reference does not disclose or suggest preparing an optical fiber preform having through holes, let alone drawing the preform to form an optical fiber with air holes. The Examiner concludes from the teachings of Suzuki et al. and Nagayama II that "[a]s suggested by the method step of the applicant's invention and by Suzuki, the annealing would also stabilize any SiO that has adhered to the

interfaces of the air holes and hence suppress the Rayleigh scattering intensity within the optical fiber.” Applicant takes issue with the conclusion by the Examiner.

The disclosure of Suzuki et al. does not make any reference to through holes in the preform or air holes in the drawn fiber, let alone that SiO₂ is produced in the through holes or air holes and that SiO₂ unstably adheres to the interfaces of the air holes as claimed. As stated by the Examiner, this suggestion came from Applicant, and not from the teachings of the prior art. Therefore, Nagayama II does not provide any basis to modify Arimondi et al. to add an additional furnace as suggest in the conclusion of obviousness reached by the Examiner.

Accordingly, the rejection does not establish a *prima facie* case of obviousness of the subject matter set forth in claim 1 and claim 2, which is dependent on claim 1.

The Examiner applied the Nagayama I reference in the rejections of claims 3-6, which are dependent on base claim 1. The reference does not make up for the deficiencies of Arimondi et al., Suzuki et al. and Nagayama II. The reference does not disclose forming an optical fiber preform having through holes which is drawn into an optical fiber having air holes, let alone that SiO₂ is produced the through holes or air holes and that SiO₂ unstably adheres to the interfaces of the air holes as claimed. In addition to the above, none of the references relied upon are directed to the problem solved by Applicant, namely, reducing transmission loss by reducing the amount of SiO₂ in the air holes of the optical fiber. Accordingly, the rejection does not establish a *prima facie* case of obviousness of claims 3-6 over the prior art relied upon by the Examiner.

For all of the foregoing reasons, it is requested that the rejection of claims 1-6 under 35 U.S.C. § 103(a) over the combined teachings of Arimondi et al., Suzuki et al. Nagayama I and Nagayama II be reconsidered and withdrawn.

Rejection Under 35 U.S.C. § 103 of Claim 8

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Arimondi et al. (U.S. Published Application No. 2005/0072192) in view of Nagayama et al. (U.S. Published Application No. 2002/0059816 hereinafter “Nagayama I”), Nagayama et al. (U.S. Patent No. 6,400,878 hereinafter “Nagayama II”), Suzuki et al. (U.S. Published Application No. 2003/0126891), and Kuwahara et al. (U.S. Published Application No. 2002/0174692). The arguments set forth above with respect to the teachings of Arimondi et al., Suzuki et al. Nagayama I and Nagayama II are equally applicable to this rejection and are incorporated herein by reference. Kuwahara et al. do not make up for the deficiencies of the aforesaid references.

Kuwahara et al. disclose a drawing furnace for optical fibers. The reference does not disclose forming an optical fiber preform having through holes and drawing the preform into an optical fiber having air holes in the drawn fiber, let alone that SiO₂ is produced the through holes or air holes and that SiO₂ unstably adheres to the interfaces of the air holes as claimed. In addition to the above, none of the references relied upon are directed to the problem solved by Applicant, namely, reducing transmission loss by reducing the amount of SiO₂ in the air holes of the optical fiber. Accordingly, the rejection does not set forth a *prima facie* case of obviousness of claim 8 over the prior art relied upon by the Examiner.

For all of the foregoing reasons, it is requested that the rejection of claim 8 under 35 U.S.C. § 103(a) over the combined teachings of Arimondi et al., Suzuki et al., Nagayama I, Nagayama II, and Kuwahara et al. be reconsidered and withdrawn.

Conclusion

For the foregoing reasons, it is submitted that the claims 1-6 and 8 are patentable over the teachings of the prior art relied upon by the Examiner. Accordingly, favorable reconsideration of the claims is requested in light of the preceding amendments and remarks. Allowance of the claims is courteously solicited.

If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicant's attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due under 37 C.F.R. § 1.17 and due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT, WILL & EMERY LLP



Cameron K. Weiffenbach
Registration No. 44,488

600 13th Street, N.W.
Washington, DC 20005-3096
Phone: 202.756.8171 CKW:ckw
Facsimile: 202.756.8087
Date: March 27, 2008

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as our correspondence address.**